THE Chemist

NOVEMBER, 1946 VOLUME XXIII, No.11

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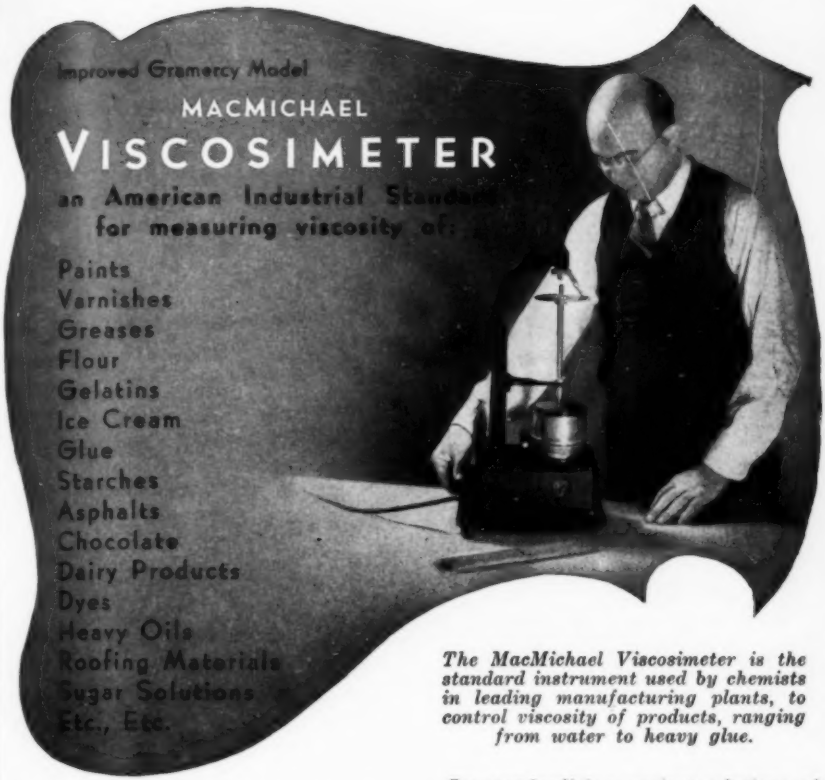

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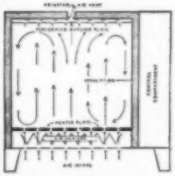

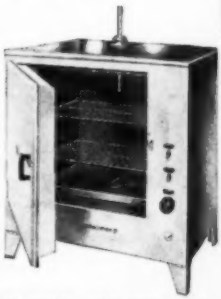

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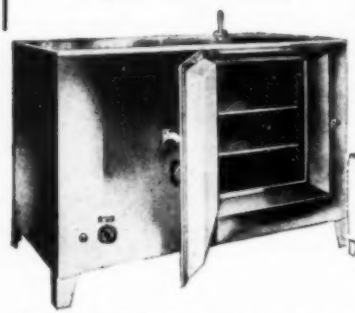

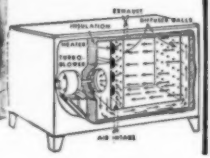

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The Scientist and His Government

Dr. Vannevar Bush

Presented at the Inauguration of Dr. Arthur Holly Compton as Chancellor of Washington University, St. Louis, Missouri.

—Acme Photo

AN occasion when a great scientist whom we all respect transfers his efforts from his field of science to the field of administration must give us pause, for it brings into relief all the implications of the position of the scientist in society. When, as now, the transfer is to the field of educational administration, we can be reasonably reassured, for in a sense, we are making an investment, foregoing the immediate and present to the future. Much as we shall miss the contributions to physics of Arthur Compton in the years just ahead, we are heartened in the thought that by reason of his participation in the great task of expanding the opportunities of youth we shall in decades to come benefit from the work of more men of his skill and acumen.

This reassurance is of particular importance now, as the nation turns from the urgent demands of war to the greater demands of peace. Washington University's new Chancellor is undertaking a problem of which time is a significant condition, for it is a real deficit in scientific manpower that we face. The lack of statesmanship in the handling of manpower problems during the war years has left us shorthanded as we face the technical tasks of reconversion and the work of restoring our scientific capital in the form of new knowledge. Moreover, the increased demands of industry, the universities, and the Government for men of specialized training in certain fields —demands flowing from an awakened realization of the power of science and technology—far exceed

the supply of young scientists and engineers. Federal support of basic science, necessary as it is if we are to attain our appropriate position in the world, is likely to increase the pressure; there will be need for patience and restraint so as to administer Federal aid that it does not result merely in an expansion of mediocrity during the critical years before the supply of trained and able men catches up with the demand. It is of the highest importance that educational administration be strong and farsighted as it deals with this widely ramified problem. Hence though we must with him regret the halt imposed upon his own direct contributions to extending the knowledge of physics, we find encouragement and satisfaction as Chancellor Compton assumes the heavy and vital responsibilities of this post. As a great scientist, he knows at first hand the present and the future needs of science and scientific education; his contributions to the advancement of learning and the stabilization of the country through this new work, we are confident, will be notable.

The Position of the Scientist

An occasion such as this is of added importance in giving us reason to consider the broader question of the position of the scientist in relation to public affairs generally, and particularly of his participation in governmennt. There are many facile statements abroad to the effect that, science having permeated our military and civilian affairs in startling fashion, it follows that scientists must participate directly and extenssively in political affairs, that is, in government. But the matter is not so simple as all that. I have no solution and no over-all recommendations, but I should like to analyze the question somewhat.

The framework within which we approach the problem is not fundamentally altered by the war, even though science has moved out of the wings and into the center of the stage; it is still the great question of how a self-governing people, a democracy, can manage the human relations involved in a complex industrial civilization. In fact the framework has been strengthened, and our faith in democracy has been enhanced in the war years. I well remember how, early in the war, thoughtful men seriously questioned whether a democracy that turned to rigid central control in order to fight in a desperate struggle could ever return to democratic ways. We have returned, as witness the turmoil in our present democratic processes. Moreover, having fought a magnificent fight, we return with reassurance as to our inherent strength, with the conviction that a democracy of free men, when it once girds itself with rigid controls for war, is the most highly effective form of government for the purpose, because the

resourceful spirit of men nurtured in freedom is an asset possessed by no totalitarian state. We return with a clear demonstration that the old assertion that democracy cannot cope with the complexities of modern existence is a fallacy.

Not that we feel that our processes are efficient in an absolute sense, nor that our pullings and haulings in the democratic maelstrom are without great waste. There is no absolute measure of the effectiveness of government, merely a relative one. During these crucial years we have seen that the disabilities of the democratic system are far exceeded, even from the standpoint of efficiency only, by those inherent in absolutism of any sort. We know the Axis nations to have failed because regimentation cannot compete with the voluntary collaboration of independent men, and because the turbulence of the democratic process somehow tosses to the heights in an emergency able leaders in whom real confidence may be reposed. We would, I trust, still hold to the free way of life even if we felt that it was inefficient. We are rallied, then, and renewed by our knowledge that democracy possesses the greatest strength for facing a complicated future.

It is fortunate that this is true, for the problems of peace, which we have held in abeyance during the war years, are very great. Our objectives for the future are clear: to preserve a government of laws and not of men; to secure a maximum of liberty to the individual consistent with equal rights to his fellows; to provide security, among the vicissitudes of nature and the ambitions of their fellowmen, for those who need security; to keep open the doors of opportunity in this free land for those who can still pioneer.

Free Enterprise in a Democracy

More specifically we seek to operate a capitalistic system of free enterprise in a democracy; for, in view of its past performance and future promise, there are very few among us who would turn from this system or who would regard our economy as matured. This undertaking involves many questions to which we do not know the answers. How do we distinguish and regulate in the public interest those industrial efforts which require great size, and in which wild competition is beginning to appear absurd, without simultaneously blocking the path of risky venture in areas of great technological change, where competition is the heart of progress? In a matured industry, where a self-perpetuating board of directors act as trustees of the interests of customers, employees, investors, and the general public, how do we make sure and continue sure that they will duly honor their trusteeship? As those who do not engage in direct individual competition, but work for a wage, organize nationally to protect their

security and their sharing in the products of industry, how do we avoid the crude procedure of bogging down the whole industrial machine, as a means of resolution of differences, while we still preserve that balance of power under law which is thus far our only answer to a dilemma? These, and many other questions face us, if we are to preserve in the future the freedom we cherish, and secure the material benefit which a technological civilization is just beginning to pour forth.

If we can make the machine run, particularly if the spirit of the war years can continue to operate, there is no doubt of the opportunity that lies ahead. We can have goods in abundance, we can avoid inflation and manage our great public debt, more important, we can grow greatly in strength, and in that strength maintain ourselves secure, forego agression of every sort, and lead the world toward united organization and permanent peace. But if the machine falters and bogs down, neither prosperity, nor strength, nor peace can long be our lot or that of the world. It is a momentous problem. The question before us is whether the scientist, by reason of his special background and skills, is called upon to do something directly about it.

Let us narrow down the problem, for there are areas where the answers are more or less self-evident and accepted. In the first place, let us talk about scientists rather than engineers. The latter are threaded through the whole industrial fabric, and participate almost inevitably in management and hence in public activities of one sort or another, so that they have their special function and opportunities as a part of the system itself. Second, let us consider the physical and natural rather than the social scientists, for it is the rapid rise of physical and natural science as an economic and industrial force which occasions our discussion. Next, let us leave out of consideration those scientists who function inside government as scientists—that is, men who form part of the civil service and work as members of their profession under government auspices—for there is no doubt as to their place in the scheme of things. Finally, we may assume that there is no question as to the participation by independent scientists as consultants to government, whether in testimony before Committees of Congress, or on special committees investigating scientific problems for the Administration, or the like. We may assume that scientists will respond generously to such calls, that they will render genuine service by making available their special knowledge in their fields, and that this activity will become an increasingly valuable feature of our system of government. We can even extend this expectation to include service, of a part-time nature, on advisory

boards of agencies or departments.

The real question does not involve this valuable, but more or less passive, aspect of participation in Government affairs, in which the scientist continues to operate within the boundaries of his special professional competence. The real question is whether, in a world in which the applications of science are shaping events, he will take an active part, and in his own initiative seek to share in government, to perform some of the duties involved in the formation and administration of law, or to be an agent in the government's controlling and regulatory functions and public service activities.

The Scientist Considers Politics

If he will seek such an active part, then there are three main ways in which he may enter, for we can leave out the judiciary except in unusual circumstances: First, he may go directly into the political arena to become elected as a representative of the people in forming or administering the law; second, he may enter into executive affairs as a government official through appointment by those in authority; third, he may join in activities which influence legislation by orientating and implementing public opinion on public questions. There is interest in considering these three possibilities.

Concerning those who go directly into the political arena, as candidates for election to public office, there is little for me to say, for I know little about the subject. I suspect it is a field in which the amateurs supply the professionals with a considerable amount of amusement. At any rate, I find that most of those to whom political affairs are a professional career have a highly developed sense of humor, which doubtless is one of the great compensations for the vicissitudes of such a life. Political life is undoubtedly fascinating, and certainly we cannot have too many men of high intelligence participating in it. The background of logic, respect for facts, and search for truth, which is the essence of the scientist's special competence, would add desirable qualities to the political scene.

The scientist who is drawn by this fascination or who is impelled by a sense of duty to contribute his intellectual power to the public service, and who therefore runs for his legislature, or for a seat in the Congress, must give heed to differences that exist between the professions in relation to government. Elective office is likely to be an in-and-out affair. This is all very well for the lawyer, for whom a term in the House of Representatives is tantamount to a period of post-graduate study. But it is different with the scientist, for whom legislative halls are a poor substitute, professionally, for laboratories. It is rather hard to imagine a research physicist spending occasional terms in the legislature, and

remaining a research physicist. This difference is one reason why there are so many lawyers in political life. The other reason is that resolution and adjustment of human relationships—of which government is one phase—is the lawyer's normal field of activity. Thus it is that about three-fifths of the men who drafted the Constitution of the United States were lawyers. Thus it is that when one thinks of elder statesmen, the names of Root, Hughes, Holmes, Hull, Stimson—lawyers all—come so readily to mind. Ordinarily we can expect lawyers to participate in political affairs and remain good if not better lawyers. Can we expect the same for the scientist?

The Scientist in Politics

Here there is special point to Bertrand Russell's remark that "skilled work, of no matter what kind, is only done well by those who take a certain pleasure in it, quite apart from its utility, either to themselves in earning a living, or to the world through its outcome." To this we may well add Justice Holmes's observation that "to fight a war, you must believe something and want something with all your might. So must you to carry anything else to an end worth reaching. More than that, you must be willing to commit yourself to a course, perhaps a long and hard one, without being able to foresee exactly where you will come out."

Now there have of course been times when scientists entered public life in numbers—at the time of the French Revolution, for example—but those were extraordinary times in many ways. In our day, the scientist who enters the political field through election is likely to be making a profound and irrevocable choice. It is not right to speak of activity in practical political affairs by scientists; rather, we should speak of such activity by ex-scientists, for scientific developments crowd so fast upon each other that the preoccupations of a term or two can easily mean a severe professional handicap for the man who was a research physicist before he went to Congress. Success in political life is not likely to attend those who treat it as an avocation, and few scientists entering politics would regard it so lightly. Hence they would imperceptibly but implacably become ex-scientists, retaining their scientific interests no doubt, but no longer active members of their own professions. As far as participation through elective office is concerned, I think we may conclude that it is fair to expect that some scientists may cease to be scientists and enter public life. More power to those who do. But those who feel that the two careers can run in parallel are likely to encounter disappointment, and are not likely to add much to the standing of their profession, or to affect the course of events very strongly or favorably.

Let us consider those who become

officials of government by appointment. First, it should be strongly noted that the experience of the war years furnished no sound criterion, for during war political considerations are suspended to a considerable degree. With the return to peace we return also to the inevitable interconnection between appointment to public office and political activity. This is an essential feature of our two-party system of Government. In general, the appointee to a policy-making post is expected to support in a very definite manner the party of the administration to which he owes his appointment. There is nothing wrong about this fact; quite the contrary, it is an essential feature of the system under which a party in power unites to carry out a set of policies, and those not willing or capable of furthering these policies join in opposition, not in administration.

It is well, however, to draw a sharp distinction between policy-making officials, and executives or managers who carry out policy. In this country, we do not make this distinction so clearly as we might, perhaps because we are still politically in our youth, and many of our troubles have flowed in the past from confusion on this point. We are progressing, slowly it is true, but in the direction of permanency of the managing group independent of the turns of politics. The growth of the system of city managers gives one example. Permanency of federal civil service appointment, extending to bureau chiefs in departments, is now fully accepted; but we have not yet proceeded to the point where full management of the current affairs of departments is in permanent hands, with the head of the department the only changing political officer. In commissions we have permanency and separation from political affairs throughout, but these are judicial and regulatory bodies.

Non-political Advisory Positions

We also have the case of the agency devoted to a specific task under permanent civil service personnel, with policies set by a part-time non-political board. The most successful example is the National Advisory Committee for Aeronautics. In cases such as the Tennessee Valley Authority, where the relationship to political affairs is not quite clear-cut, there has sometimes been turmoil before matters have settled into form. The normal form, which seems to work best, is one where there is a clear distinction between the policy-forming head, quite definitely a political appointee, and the operating staff which abstains from all political activity. This can safely be departed from, in agencies concerned with subjects which should with general consent be kept outside the field of political considerations, by substituting for the politically appointed official a part-time voluntary policy-making board, made up largely

of professional men, all of whom are politically inactive. It can still be accomplished in cases where the subject matter is of a semi-judicial nature, by utilizing non-political full-time boards. But it should be forcibly noted that, if members of such boards do become politically active, even in apparently innocuous ways, the special form will not long work well.

This phase of the subject offers no great problems as far as participation by scientists is concerned. When they enter into the permanent establishment they become part of the civil service, divorced from politics, and simply scientists pursuing their professional careers under government auspices. When called to serve voluntarily on special boards, they appear primarily as professional consultants or advisers, taking general policies as set by Congress and rendering these specific as they become applied to particular instances by the permanent staff. In so doing, they properly stand outside the currents of political life and remain scientists contributing as citizens their special knowledge or comprehension of problems whose solution is important to the whole body of citizens.

Yet the scientist who enters upon work such as this will do well to bear in mind that assuming a clearly non-political post of this kind may bring about an alteration of his career just as effectively as would his acceptance of a frankly political policy-making appointment. In the related field of engineering we have seen that assumption of a nonpolitical task which called for the special administrative and planning skills developed in professional life can by the logic of events become basis for subsequent political undertakings leading a man out of his professional into a political career. Herbert Hoover's distinguished record is the one I have in mind. For the extremely difficult and delicate handling of relief after the first World War, the remarkable capacity as an administrator which he had devoloped in farflung professional activities made him admirably suited. From that nonpolitical application of his special skills, others and undoubtedly he himself were brought to the conclusion that direct participation in political affairs was required of him in order that the greatest social good should be secured from his abilities. Just as Mr. Hoover could not have forseen in entering the work of feeding and clothing the victims of war that he was almost irrevocably departing from his engineering career, so the scientist who today takes a place on a special board may be unpredictably making a choice whose full significance will become clear only in later years. I do not by this mean to warn or to admonish; I mean simply that we should recognize the condition and have it in mind.

Now from this consideration of appointive office and the scientist we

can run traverses that will be valuable in surveying the third field of action on political affairs into which the scientist can enter. Political activity involves not only the making and administration of law, not only the performance of elective or appointive office, but also, and very decidedly, the vast range of action by which public opinion on specific issues becomes formulated, and once formulated becomes effective by directly influencing the acts of legislators and officers. It is in this region that scientists are most likely to enter in numbers. The activities range all the way from the isolated and independent expression of opinion by a citizen to the highly organized lobby. The transition from one to the other is gradual. The apt pronouncement of an individual of thoughtfulness and wisdom, unconnected with any movement, sometimes strikes the exact note to produce a spontaneous response and consequent action. From our general experience in government, however, we know that the isolated unorganized activity is not likely to be very effective in a practical way, but that the highly organized effort can be very effective indeed, sometimes appallingly so. Whatever we may individually think of the process, it is a vital part of our democratic system in practice.

Every citizen of course is and should be free to express his frank opinion on any subject of public interest, and it is heartening when scientists do so forcefully and effectively, as citizens. Whether the issue lies within the scientist's field of special competence or not, there is no inherent difficulty here. In fact, there is a great opportunity, for the accomplishments of a scientist assure, at least momentarily, that he will be listened to, and, if he does not presume too much on his acceptance and speak didactically about matters on which he is really ignorant, this situation may even persist, and his influence be great and salutary.

By all means, then, let us have plenty of public utterances by scientists speaking as uniquely qualified citizens on scientific matters, and let them be authoritative as may be. By all means let us have plenty of opinions on the public issues of the day from scientists as citizens among citizens, but let them be so reasoned and considered that they bear no delusions of grandeur, no assumption of omniscience.

It is well to remember that the present strong acceptance of the scientist will endure only if he combines modesty and skill with his authority, as has indeed been admirably done by most of those who have spoken. Moreover, we must recognize that the boundary between the individual citizen's public discussion of political issues and his participation in other political activities is vague, that the boundary between advocacy of legis-

lation and conventional lobbying is obscure, and that those whose normal lives lie in the political field expect newcomers to learn some of the traditions and usages. As in all things, the local team expects the visitors to learn the local ground rules; and no special exemptions are likely to be made permanently just because a man is a scientist, however interesting he may be.

Organized Political Activity

The question of organized pressure for specific legislative programs is a very different matter from the individual scientist's speaking his mind as a citizen. There are subjects in which scientists as a whole have very definite interest, about the public value and importance of which they have convictions based on their professional understanding, and on the main issues of which they are nearly unanimous. Should they act as a group, and if so, how? Here I am frankly puzzled. I suggest that we are all going to learn a great deal about this question in the years ahead.

I know that many, if not most, scientific and professional men shy away from organized political activity, with all that it implies of the intricate interplay of the press and radio, commentators and columnists, lines of political influence, and the practical machinery of politics, regarding it as unprofessional if not unethical. With the charge that such activities are unethical, I have little sympathy. Unethical acts in plenty have been perpetrated in the general field of political pressure in the past, but I think most are agreed that the general trend is toward higher standards as the years pass, and that, after all, standards are seldom raised in any activity by those who stand aloof. But the charge of unprofessionalism makes me pause. In the differences between rural and urban groups, between investors, management, and employees, between the interests of geographical areas, it is very salutary that the professional groups formed a detached, unbiased section of the population, as indeed they do. The presence of a balance wheel of this sort in the evolution of our political procedures may be so valuable that we should bend all our energies toward preserving and enhancing it. To do so would be to reemphasize the significance of scientific impartiality to which I have referred in connection with the participation of scientists in government through work of advisory committees, non-political commissions, and agencies concerned with the effectuating of policy elsewhere determined.

The Importance of Scientific Group Action

But scientists agreeing in principle with this thesis may encounter situations in which they are maturedly convinced that group action by men of special knowledge or particular professional competence is needed in

the public interest — convinced that in the absence of that action the public will suffer. To arrive at such a conviction concerning an issue deriving from or markedly involving science is by no means incompatible with the preservation of the professional spirit. Given such a case, I believe scientists should either enter upon their action with full effectiveness, assiduously learning and applying the new and delicate art, or else they should leave it alone.

The group that gathers, discusses, passes a resolution, and adjourns forthwith, may clarify some of its own thinking, but as far as influencing the thinking of the general public or of the legislature is concerned, it is not likely to accomplish much. The greater is this danger as the issue producing such action is farther from the fields in which their competence centers. But if the group comes together to deliberate and act in support of an issue such that the expression of competent scientific judgment may influence legislation for the general betterment and if the group evidences the judgment and acumen rightly to be expected of scientific and professional men, it may accomplish much. It has a better chance of doing so if it recognizes the peculiar demands of an activity quite foreign to its background and traditions, and energetically tries to meet them. The respect which legislators generally hold for scientific and professional men—and I am convinced that in general this respect is active and real—is likely to become enhanced rather than decreased if they find such groups truly able in the field which they themselves know so well.

In recent months we have seen cases where group opinion of scientific men has been truly effective; it has been voiced after careful and deliberate thought; it has been firm and judicious, not strident and undignified; its pattern of expression has been planned and thought through to a conclusion. I have admired the spirit in which the effort has been conducted, even in cases where I have frankly disagreed with the conclusions or the emphasis. Some efforts, I believe, have failed to be effective, or in fact have produced results that must have been quite other than those intended or expected, and I believe in every case this outcome has been due to lack of complete comprehension of the way in which the mechanisms of public opinion and political action really operate. Perhaps we are seeing the beginning development of a new and lasting procedure which will justify public belief that action by scientific groups is truly done in the public interest, and not in the special interest of the group that acts. Should this be so, should there be coming into American life a means whereby scientists, entering this aspect of political affairs upon justified occasions, can bring to bear in a new field some

of the intellectual skill and integrity which have made American science great, these instances will later be seen to have been profoundly significant.

There can be no question of the continuing part which science will play in the economic and hence in the social and political life of the nation. Through all three of these lines of action it will constantly impinge upon the great structure of education which is fundamental to the free *ways* of life. It must be met there by broad and able minds, rich in knowledge and s t o r e d with wisdom.

City College Centennial

The City College of New York is celebrating, during the academic year 1946-47, the completion of one-hundred years of free higher education. The schedule of centennial events includes exhibits, dramatics, conferences and special lectures to be given during the year.

Read Appointed to War Department Staff

Dr. W. T. Read, F.A.I.C., former dean of the School of Chemistry of Rutgers University and for the past three years a member of the staff of the National Roster of Scientific and Specialized Personnel, has been appointed as scientific research advisor to the Research and Development Division of the War Department's General Staff. Dr. Read will represent chemistry and chemical engineering in the Scientific Liaison Group, which works with all research and development divisions of the War Department and other agencies; with educational institutions, and with private industry to coordinate scientific resources and activities.

At the Princeton University conference on Engineering and Human Affairs, October second to fourth, Dr. C. R. Downs, F.A.I.C., participated in the symposium on "The Efficient Utilization of Materials". Guests of the university included Earl B. Babcock, F.A.I.C., director of chemical laboratories, Firestone Tire and Rubber Company; Dr. Lawrence W. Bass, F.A.I.C., director of chemical research, Air Reduction Company, Inc.; Dr. Norman A. Shepard, F.A.I.C., chemical director, American Cyanamid Company, and James G. Vail, F.A.I.C., president, American Institute of Chemical Engineers.

The American Universities in England and France

Dr. Ward Vinton Evans

(Acceptance address before the Chicago Chapter, A.I.C., on receiving the Honor Scroll Award)

MY latest teaching assignment concerns us all since it had to do with personnel in your Army, and specifically with the teaching of chemistry.

As you know, veterans are guaranteed a certain amount of education by our government, provided that they can qualify for it. When the war ended in Europe, the Army suddenly developed a plan for taking that education overseas to the boys who had to remain there on occupation duties. So-called "command schools", on secondary school level, were set up in many areas, and Army Universities, offering courses exactly as they would be given in this country were established—one in England and one in France. My particular duty was to set up and provide the teaching staff for the chemistry departments in these two universities, at Shrivenham, England, and Biarritz, France.

In the spring of 1945, I spent a month collecting this staff which consisted of ten civilian teachers from American universities, and eight drawn from the Army who are college teachers in civilian life. Intensive courses in eight-week periods were offered and only the best qualified G.I. applicants were admitted as students. In all, 18,000 men enrolled; about ten per cent of these were in the chemistry courses. As usual when the Army undertakes any new project, it spared no trouble nor expense to equip and operate these schools. It was astounding to find lab-

oratories and classrooms set up as fast as we ordered them. It was most heartening to have the response we had in personnel. All of us agreed we had never taught such eager, serious students as those G.I.'s who knew by then what it was all about; and a finer, more cooperative teaching group was never assembled anywhere.

The universities were typical American universities, even to the Saturday afternoon football games last fall. Credit for the courses could be transferred to the colleges at home when the boys returned, thus shortening the time so many had to make up on their education.

Our general chemistry course carried a credit of six units, meeting five times weekly, with six hours of laboratory work, two hours of conference and two hours of quiz. The ground covered was approximately one semester of general chemistry. At Shrivenham we ran four sections of this course. Following it, students were ready to start the chemistry of the metals and qualitative analysis.

The organic chemistry consisted of two sections of forty students each, with four lectures, two conferences and one three-hour laboratory period each week. We covered the aliphatic compounds in this time.

The physical chemistry was a semester course, carrying three units of credit and meeting five times weekly. We offered no laboratory but *plenty* of problems.

In addition to these, we had a course in advanced organic chemistry, five hours a week; and at Biarritz, a course in semi-micro qualitative analysis.

We had laboratory space for one hundred and sixty students in general chemistry and sixty in organic. How a first class laboratory was made from a kitchen, as Berzelius or Scheele would have done, is a story in itself. How it was equipped by many "scrounging" expeditions by air, train, and truck, to liberate apparatus and chemicals which originated in Italy, Germany, France, and England, is also a story that perhaps I should not dwell upon too extensively. Considerable quantities of this material were also collected from our own supply dumps in England. The actual construction and place for the laboratory was conceived by our military personnel, who arranged the building and equipping of desks and lockers, the storeroom, and balance benches. Actual labor was done by German war prisoners, or "P.W.'s". The supplies that were collected and catalogued coupled with the ingenuity of the faculty and their skill as glass blowers, made an admirable laboratory. The storeroom was in charge of very capable P.W.'s, one of them a school teacher by profession. The laboratory floors and desk tops were cleaned daily by P.W.'s.

The chemistry given at these American Universities compared favorably

with any chemistry given in the States, for three reasons: 1. The students were carefully chosen, serious men who desired an education. 2. We had a faculty of superior teachers, very much interested in student problems and capable of imparting chemical knowledge in the best possible way. The success of a project such as this depends upon men who can teach and who love to teach; men willing to leave their jobs back home to bring their experience and knowledge to the soldiers. 3. The fact that our military personnel were there on the ground, able to organize our excellent laboratory, collect supplies, catalogue them and put the machine in motion.

The students were drawn mostly from units not expected to be sent home within the school term. They were not problem children but real students. They were ready to work at their books just as hard as they fought in Germany. There were practically no absences either from class or laboratory. They were under a minimum of Army discipline and they were finding their way back scholastically in a satisfactory manner. They even *asked* for "home work" when none was assigned.

Our classes were held from eight to twelve and from one to five daily, except Saturday and Sunday. Student programs were so arranged that most of the work could be taken either in the morning or the afternoon, thus making half of each day available for extra-curricular activities, such as athletics, orchestra glee club, drama, and educational trips to historic shrines. There was no military drill. The library was spacious and crowded with eager students all day and until late in the evening.

Many visitors came from English schools. A definite lecture program for both students and faculty was organized, and it brought the best lecturers in England on special topics.

This American University was situated at Shrivenham in south central England, about seventy-five miles from London and twenty-three miles from Oxford. The surrounding country is noted for its scenic beauty and its points of historic interest. Shrivenham itself is a typical English village with thatched roofs, beautiful flower gardens, and old buildings covered with ivy.

The campus was in an old estate dating from 1300. The forest surrounding the old castle is of great beauty, with many trees more than two hundred years old. Fine new buildings, permanent brick structures, were completed here in 1937 for the British Army and used as an officers' training school during the war. They needed little changes to turn them into our university classrooms and dormitories. These efficient modern features contrasted startingly with the old and picturesque. Our mess was in Beckett Hall, once the home of King

John. While some G.I.'s fished in the castle moat, other inside dropped coins into juke boxes or coke machines.

Each weekend, special trips for faculty and students were arranged, taking us by bus or train to Oxford, Bath, Bristol, London, Stratford-on-Avon (with matinee and evening performances of Shakespeare's plays at the beautiful Memorial Globe Theater), Stonehenge, Salisbury, Bournemouth, Windsor Castle, Kew Gardens, etc. Since the transportation was furnished by the University and the trips were well planned, it was possible to see more of England, in short intervals, than could otherwise have been done. The men were fortunate indeed who enjoyed this respite from Army routine in such beautiful surroundings, with opportunity to advance their education and take part in these rich cultural experiences at the same time.

To set up a university in Biarritz, it was necessary to requisition some eighty-five hotels and some thirty-five villas. Here we had four-thousand students and a faculty of two-hundred and seventy-five, ranging in age from forty to sixty-five. In the science section, of fifty-one teachers, thirty-nine were Ph.D.'s; most of the others were Army officers. There in southern France was the advantage of fine climate, beautiful scenery along that picturesque shore with the snow-capped Pyrenees in the distance, and the luxurious surroundings of that resort city to restore mind and body. The courses were conducted there in the same way, with the same credits given.

Both Universities closed when most of the American boys had been returned home. I was sent to Germany, with headquarters at Frankfurt, as a lecturer on the atomic bomb. Giving some ninety lectures to more than ten thousand G.I.'s, we travelled by plane, rail, or jeep, and once in a "40 and 8". This work was rugged in spots, but very stimulating. Always we had the most responsive audiences—boys who were intelligent and eager for information. These "one night stands" kept us constantly on the move and enabled me to see practically all of Germany not in the the Russian zone.

Outside the cities, which are depressing, the country is still beautiful, and in the Bavarian Alps one hardly feels the effects of war. I spent some time visiting German universities, what is left of them, going through their literature on atomic experiments, visiting I. G. Farben, and other plants; the salt mines; concentration camps; the War Trials at Nuremberg, etc.—trips I am very glad to have made but which I should not care to repeat. Perhaps my most heart-warming experience was the lecture tour I made of the Dutch universities, again because of the responsive audiences of students. Cut

off during those long years of occupation by the enemy, those men were so eager for news of scientific work in the civilized world that their appreciation was enormous and very gratifying.

Most of those months overseas begin to assume the clouded aspect of a dream, some of it nightmarish. The enduring impressions, as at home, are made by the friends one finds—the homely peasant with whom one goes fishing; the fellow-scientist who speaks a different language but recognizes the same formulae; the boy who lingers after class to ask a question; the youngster who follows, begging a chocolate bar. In any language, in any country, at any age, one recognizes friendliness. Friendliness gives meaning to life. The evidence of your friendliness on this occasion makes today one of the memorable days of my life.

Ward Evans—Teacher, Scientist, and Citizen

Dr. Gustav Egloff, F.A.I.C.

(Presented at the Honor Scroll Award Dinner of the Chicago Chapter, A.I.C.)

WARD V. EVANS is held in highest esteem by his fellow chemists for his achievements both as a chemist and as a teacher. Moreover, his fascinating personality has endeared him to all those who have had the good fortune of knowing him. His deep sense of responsibility to other human beings has resulted in an almost complete lack of self-consciousness. The secret of his charm perhaps, lies in his consequent ease and naturalness.

Ward's success has been entirely the fruit of his own efforts. His teaching career began in a one-room country school for which he was janitor as well as principal. He built up a reputation through the unique but effective methods which he used in coping with troublesome situations. The County Superintendent of Schools quite frequently sent Ward to straighten out a school which had become unruly. The results were always such that a mousey school girl could have taken over after he had finished.

Ward did not go to high school, but made up that work while in college. At the same time, he was earning his college expenses by teaching and other jobs. I first knew him when we were graduate students at Columbia University in 1913. Then he was travelling about seventy-five miles per

day up the Hudson River to fulfill teaching duties from which he derived his income. During my many years of travelling and observing some of the world's most outstanding men, I have never met such a human dynamo as Ward Evans. Always keenly aware of what was to be done, he pursued his objectives without distraction. In the pursuit of a goal, however, he did not employ that ruthlessness which characterizes the action of so many who will let nothing stand in their way. Instead, Ward has been extraordinarily benevolent and unselfish.

His activities over the past thirty years as professor and later as head of the department of chemistry at Northwestern University are well known. In spite of the fact that these were big jobs in themselves, Ward found time to do chemical consulting work and render services outside the field of chemistry to Northwestern and his community.

Evans was particularly well known for his problems course in physical chemistry, which he taught at Northwestern and gave several times at the University of Chicago under the sponsorship of the American Chemical Society. For many years, he bore the brunt of the freshman teaching work. His teaching apparently carried with it as much expertness in human relations as instruction in chemistry. There was always a long line of students, ranging from freshmen to Ph.D. candidates, waiting outside his office for conference on personal problems as well as those relating to their work. That he was successful is attested by the number of students who flunked his courses but still remained his friend. Dr. Summerbell, now chairman of the department, has said that, "Ward could call a student more kinds of dumb and still retain his friendship than any man I ever saw."

Ward has been an inspiration to many of his students. Among them is Dr. F. H. Lee, now dean of the College of Science at the University of Nanking, China. When a student, his admiration for Dr. Evans led him to plan his life after Evans as nearly as possible. Dr. Lee remarks that as of today he has the same number of children in the same sequence but feels that he is lagging behind Ward as a teacher and a citizen.

Ward, as head of the department of chemistry at Northwestern, was helpful in bringing Dr. V. N. Ipatieff to this country. Through his invitation, Dr. Ipatieff came to Northwestern as a visiting professor in 1931. This event has resulted in the establishment of the Ipatieff High Pressure and Catalytic Laboratory at Northwestern which is directed by Ipatieff, the father of high pressure chemistry and the world's foremost authority on that subject.

Ward's consulting experience has involved everything from candy to wall paper and explosions. Much of

his consulting work was in the form of legal experting. It is well known that he would never take a case unless he believed it a righteous one. Usually in explosion cases, Ward was sought after by both sides and thus had the opportunity to choose the one he knew to be in the right. When these circumstances occurred, none but highly inexperienced lawyers ever brought a case to trial against Ward's side.

He contributed much more than his share to the war effort. His knowledge of chemical warfare in the fields of explosives and poison gases were greatly needed in both wars. He served as an explosives expert in the Army in World War I. During the early years of World War II, he spent two or three nights a week lecturing on protection from poison gas attacks and explosives. His audience consisted of members of the police and fire departments and civilian defense workers. The city of Chicago is deeply indebted to him for this valuable service.

Ward Evans' zest for life and interest in people have led him into several outside fields. One of these is that of the University's student publications. For years he was chairman of the committee that supervised the Year Book, comic monthly, and daily. He seemed to inspire the young journalists with a sense of responsibility which enabled them to turn out some of the best college publications in the country. During his sponsorship, they received numerous awards of merit, and believe it or not, accumulated a bank balance of $40,000.

He has been a keen lover of sports since his boyhood days. He has retained his interest both as a spectator and participant. Until the year of his retirement, Ward was catcher on the baseball team at the chemistry picnics. Northwestern took advantage of his interest in these activities and appointed him to the Athletic Committee which has the preplexing task of satisfying both the alumni who think the university should have professional athletes and the professors who think football is pure luxury and perhaps a curse. Ward succeeded in keeping both sides as happy as possible during his years on the Committee.

The sport for which he is most famous is fishing. His skill as a fisherman includes the usual failing for telling stories longer than the fish. The real love which he has for fishing is evident from the following incident related by his colleagues, Lee Supple, who was with him in southern France last spring. Ward had been taken by his friend to the ocean front where the Basques were fishing. Every day thereafter he would say, "Lee, let's take a walk". Lee always asked, "Where shall we go"? Then Ward's answer would be, "Oh any place, just take a walk". Then every day, Ward would make a bee-

line for the spot where the fisherman were, and hang around to watch them fish. Lee is sure that they went there at least fifty times.

In 1945, he retired as head of the Chemistry Department at Northwestern, but "retired" is a very poor word to use in describing his subsequent activities. He voluntarily left one of the world's finest and best equipped chemistry departments to teach for the Army University in war scorched Europe. The problems abroad were a challenge which only a man who truly loved teaching would care to encounter. Laboratories and classrooms had to be built from the equipment that could be salvaged from Italy, Germany, France, and England. Course work was given in concentrated form with a semester's work being covered in eight weeks.

Ward's letters, written while he was at the Army Universities in Shrivenham and Biarritz, were always cheerful. It was apparent that he was enjoying his assignment thoroughly and making the most of the opportunities to meet people and see the countryside. He took particular pleasure in instructing a select group of soldiers, just off the battlefield, who were at school solely because they were interested in learning. Immediately after visiting the Netherlands, where he lectured at Delft and Amsterdam, he made an appeal for back chemical journals which these Universities had not been receiving for over five years. He told about the deplorable conditions under which the people lived over there, but not one word was mentioned about any personal discomforts.

His first year of so-called retirement has been one of the most active years of his life and one may be sure that the years to come will be as fruitful as the past. As one illustration, Ward is continuing his teaching at Loyola University as professor of chemistry. Fortunate indeed are those who are in such close contact with him.

New Officers Elected

The Miami Valley Chapter of THE AMERICAN INSTITUTE OF CHEMISTS elected the following officers on October 24th: Chairman: Dr. George F. Deebel (Dayton); First Vice Chairman: Mr. George G. Garnatz (Cincinnati); Second Vice Chairman: Mr. William J. Neill (Columbus); Secretary: Mr. Eugene R. Ewell, 73 Cardington Road, Dayton 9, Ohio; Assistant Secretary: Miss Jacqueline Front (Dayton); Treasurer: Major Robert W. McLachlan (Dayton) and Council Representative: Mr. Edgar W. Fasig (Dayton).

An article on the American University in Italy is being prepared for a future issue of THE CHEMIST.

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Dr. Foster Dee Snell, president of The American Institute of Chemists, was elected an honorary member of The Chemical, Metallurgical and Mining Society of South Africa, Inc., for the year ending June 30, 1947.

Dr. Johan Bjorksten, F.A.I.C., announces that Dr. C. Robert Moulton has joined the staff of Bjorksten Laboratories, Chicago, Illinois, as research associate. Dr. Moulton recently was advertising counsellor and consulting chemist in the food field.

CHAPTERS

Chicago

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The Chapter held a testimonial dinner to Professor Ward Vinton Evans, at the Furniture Club of America, October fourth. Dr. Evans was presented with the Honorary Scroll Award, which is awarded annually by the Chapter. Speakers were Dr. Franklyn B. Snyder, president of Northwestern University, and Dr. Gustav Egloff, F.A.I.C. The latter paper and Dr. Evan's acceptance address appear on pages 433 to 440 of this issue of THE CHEMIST.

Chemical Condensates

Ed. F. Degering, F.A.I.C.

Acetylsalicylic acid, is known also as: Acetosal, Anglopirin, Aspirin, Asposal, Atopin, Coxpyria, Empirin, Helicon, Nupyrin, Regipyrin, Salacetol, Salaspin, Salcetin, and Xaxa.

Now we face another shortage, according to Director Guy Burch of the O.S.R.D.—brain power. "High school and college graduates are having about 1¾ children on the average, white persons with less than seven years of schooling are having four children."

Approximately 11 million pounds of Marvinol, a polyvinyl resin, is to be produced annually in a $1,500,000 plant being built by Glen L. Martin Company.

The commercial production of white crystalline penicillin is announced by Heyden Chemical Corporation. This dry, pure, form of penicillin may be stored up to three years without refrigeration.

These three things, will, work, success, fill human existences. Will opens the door to success, both brilliant and happy. Work passes these doors, and at the end of the journey success comes in to crown one's efforts.

—*Louis Pasteur.*

The chemist's prayer: God, give me sympathy and sense. And help me keep my courage high. God, give me calm and confidence: And, please —A twinkle in my eye!

Should the Supply of Chemists Be Regulated?

The subject of regulating the supply of chemists in some manner, according to the demand, is the topic of discussion for the December 13th meeting of the Chicago Chapter of THE AMERICAN INSTITUTE OF CHEMISTS. A panel composed of the following speakers will lead the discussion: Dr. A. L. Elder, Corn Products Refining Company; Dr. Johan Bjorksten, the Bjorksten Laboratories; Dr. M. T. Carpenter, Standard Oil Company (Indiana); Dr. V. I. Komarewsky, Illinois Institute of Technology, and Dr. Charles L. Thomas, the Great Lakes Carbon Company. The meeting will be held at the Electric Club, 20 N. Wacker Drive, at 6:15 p.m. All members of the INSTITUTE who expect to be in the Chicago area on that date are invited to attend. Reservations should be made by calling Mary Alexander, Secretary, HARrison 9690.

Jersey Standard Expands Executive Training

Standard Oil Company of New Jersey has expanded its executive development program. Eugene Holman, president, stated that, "we believe that it is one of the first duties of business to develop leaders of promise and to promote their training." Under the Jersey program, executive training is based on a continuing analysis of executive functions and personnel by committees. These groups select personnel of the greatest promise for development. After careful appraisals of the selected personnel, steps are taken to fill gaps in experience. The company also sends men to educational institutions for special courses, particularly in general business and management methods.

Dorn Apointed Chairman Frozen Food Research

The Frozen Food Institute, Inc., announces that Dr. Herman W. Dorn, F.A.I.C., has been appointed chairman of the Research Committee as a part of the program of the Institute to undertake progressive research in the frozen food industry. Dr. Dorn is at present supervisor of the Bio-Chemistry, Process, and Product Research Division of the Owens-Illinois Glass Company at Toledo, Ohio. He is also chairman of the Toledo Section of the American Chemical Society.

Whitney Receives Industrial Research Medal

Dr. Willis R. Whitney, General Electric Company, received the first Industrial Research Institute Medal, at a meeting of the Industrial Research Institute, Inc., in Rye, New York, on October 17th. Dr. Whitney was honored for his outstanding contributions to the field of industrial research, as a distinguished scientist, research pioneer, and leader of men.

Evans Forms New Corporation

Dr. Ralph L. Evans, F.A.I.C., directing head of Ralph L. Evans Associates, chemical consultants, 250 E. 43rd St., New York, N. Y., has formed a new company, Evans Research and Development Corporation. Recent expansion and rapid diversification of activities necessitated the formation of the new company to handle consulting activities relating to applied research and commercial development. Fundamental research and consultation in general will continue within the scope of the Associates group.

Officers of Evans Research and Development Corporation are: President, Dr. Ralph L. Evans; Vice President, Dr. Everett G. McDonough; Secretary and Treasurer, James Lawrie. Dr. Eric J. Hewitt will be administrator of the Laboratories and Director of Research. Other executives are: Carleton Sawyer and Edwin C. Kenton, Technical Liaison; S. F. Coneybear, Development Manager.

The first meeting of the season of the Society for Applied Spectroscopy was held October first at the Pennsylvania Hotel, New York, N. Y. Dean George R. Harrison of the Massachusetts Institute of Technology addressed the group on the subject of the present status and future trends of spectroscopy. The meetings of the society are open to the public.

United Nations' Division of Atomic Energy Starts Discussion

The United Nations' Division of Atomic Energy scientists and political representatives are continuing technical discussions on control plans to prevent the diversion of uranium and thorium. Professor Pendleton Herring, director of the U.N. secretariat division of atomic energy, suggested a program to divide discussions into the stages of the atomic development process: (1) Uranium and thorium mines, (2) concentration plants, (3) refineries, (4) chemical and metallurgical plants, (5) primary reactors and associated chemical separation plants (6) isotope separation plants, and (7) secondary reactors. Sir George Paget Thomson, British physicist and Nobel prize winner, suggested a three panel discussion: (1) raw materials, their extraction and refinement; (2) separation problems; (3) uses of materials. Lack of sufficient personnel to staff three panels, finally resulted in a desicion to take up first the discussion of raw materials in informal conversation in closed sessions.

Keyes Elected to Board of American Potash

Dr. Donald B. Keyes, F.A.I.C., vice president of Heyden Chemical Corporation, has been elected to the Board of Directors of the American Potash and Chemical Corporation. He was also named to serve on the board's executive committee.

Atomic Energy Commission

President Truman has appointed David E. Lilienthal as chairman of the new Atomic Energy Commission. Other appointments are: Dr. Robert F. Bacher, physicist of Cornell University, Sumner T. Pike, formerly member of the Securities and Exchange Commission; Lewis L. Strauss, partner Kuhn, Loeb and Company; and William W. Waymack, editor the *Des Moines Register and Tribune.*

The Commission will function under the Atomic Energy Act of 1946, and will have operating control over all phases of atomic energy. To it will be transferred the War Department's Manhattan District, which will continue its work until such a transfer can be effected.

President Truman stated that, "We look to this Commission to develop and carry on an ever-expanding program through which the benefits of atomic energy may be realized."

Navy Selects Scientists

The United States Navy announces the selection of ten scientists as members of the Research Advisory Committee. Those chosen are: Dr. Arthur H. Compton, chancellor, Washington University, St. Louis; Dr. Karl Compton, president, Massachusetts Institute of Technology; Dr. Warren Weaver, director, Division of Natural Sciences, Rockefeller Foundation; Dr. Philip M. Morse, professor, Massachusetts Institute of Technology; Dr. L. A. Du Bridge, president, California Institute of Technology; Dr. William Sharp McCann, director, Institute of Medicine, Rochester University; Dr. Detlev W. Bronk, National Academy of Sciences; Dr. Richard J. Dearborn, head, patents committee, National Association of Manufacturers; Rear Admiral Luis De Flores, former assistant chief of naval research; rear Admiral Lewis L. Strauss, on inactive duty.

Trade Mark Regulations

The Patent Office is preparing new rules and regulations for the registration of trade marks in accordance with the Lanham Act, which becomes effective July 1, 1947. Under it, trade marks formerly not registerable, such as geographical, descriptive, or certification marks, are registerable. The Lanham act also provides that a trademark cannot be contested after it has been registered five years while in continuous use.

The trouble is, not that science lacks the ability to work miracles, but rather that we lack the faith to ask the scientists for what we want or need. Problems reduced to concrete specifications and turned over matter-of-factly to open-minded research men of broad experience have a way of turning into milestones of progress.

—*The Research Viewpoint.*

For Your Library

MODERN DEVELOPMENT OF CHEMOTHERAPY. By H. Veldstra a.o. Monographs on the Progress of Research in Holland. *Elsevier Publishing Company, Inc.* 1946. 175pp. $3.50.

This book is a member (No. 4) of a series of monographs on the progress of research in Holland during the war years.

This volume is a record of the chemical as well as the pharmacological, immunological and clinical investigations on the sulfonamides and on p-aminobenzoic acid, which were carried out secretly in The Netherlands during the occupation.

There is also a chapter dealing with work done on antibiotic substances such as "Expansine" prepared from the culture liquid of Penicillium expansum. This material differs chemically and therapeutically from penicillin. It is relatively toxic and its applications are therefore limited to the treatment of skin mycoses and other local affections. A number of mycotherapeutic case histories are given.

Every chapter is followed by an extensive list of references, a number of which are to be found in Dutch journals, which at present may be somewhat difficult to obtain.

Anybody interested in modern chemotherapeutic developments will undoubtedly find a great deal of interest in this neat little volume and its publishers, Elsevier Publishing Company, Inc. are to be commended for making this series available. It is sincerely hoped that this book will be well received and that it will fulfill the hope of its editors, namely that it will demonstrate the whole-hearted preparedness of The Netherlands to contribute to the progress of mankind.

—Wm. H. Van Delden, F.A.I.C.

ATOMIC AND FREE RADICAL REACTIONS. By E. W. R. Steacie. *Reinhold Publishing Corporation.* 1946. 550 pp. 9¼" x 6⅜". $8.00.

In the development of physical chemistry, the mathematical concepts of equilibrium and speed of reaction required an activating energy. This energy was found to be related to the heat of reaction, satisfactorily for equilibrium conditions but not for speeds of reaction.

The speeds of reaction required much different energy sources, often of a very large value, which were balanced at equilibrium. To account for these energy sources, quantum data associated with absorption and emission of radiation, mechanisms of reaction through free radicals, and special reactions in the presence of catalysts were postulated.

This volume assembles to date the data on special mechanisms and sequence or "chain" reactions involving atoms and radicals. The reactions are classified and tabulated in an appendix and index.

To anyone interested in reactions, and this means particularly all research chemists, and all chemists at some time or other, this volume will be of value. It is rich in many suggestions for mechanisms of chemical change.

—John A. Steffens, F.A.I.C.

THE STORY OF LINEN. By William F. Leggett. *Chemical Publishing Company, Inc.,* 103 pp. 5″ x 8″. $2.75.

This carefully and pleasingly written book contains the history of linen from the time of its first cultivation in Egypt over 5000 years ago. Chapters are entitled: Flax, Ancient Spinning and Weaving, Linen During the Stone Age, the Phenician Interlude, Linen in Egypt, Linen of the Hebrews, Linen in Greece, Linen in Rome, Linen in the Medieval twilight, Linen in Flanders, Linen in France, Linen in England, Linen in Ireland, Linen in Scotland, Linen in Colonial America. The addenda contains notes on ramie, hemp, sisal, and jute.

Linen's role throughout the ages is a fascinating story, here enlivened by colorful bits from recorded history, thus, "Homer relates that Odysseus made several trips to 'River Egyptus'—probably the Nile—to capture women and children, who had been trained as makers of fine linen, and who were later sold as slaves to Greek nobles. Homer tells us that unskilled women brought four oxen in the market place, whereas for skilled workers, twenty oxen were demanded."

This book is by no means technical, but it will appeal to anyone who seeks a concise history of linen for background material, or to anyone who simply desires some interesting facts about this familiar fiber.

EXPERIMENTAL PLASTICS AND SYNTHETIC RESINS. By Gaetano F. D'Alelio, F.A.I.C. *John Wiley and Sons, Inc.* 1946. 185 pp. $3.00.

This manual is a revision of "A Laboratory Manual of Plastics and Synthetic Resins," published in 1943. It is a great improvement over the earlier edition and is one of the few short books on plastics which can be highly recommended. It should be excellent for college laboratory courses, and most plastics chemists would find it somewhat useful because it contains a convenient collection of tests and analytical methods and a list of sources of supply for the resins and monomers.

It claims to include practically all the well-known resins which can be readily prepared in a small laboratory. The number of new materials which are included in the short space of ninety seven experiments is certainly surprisingly large. Vinylidine chloride, diethylene maleate-styrene, melamines, cross-linked methacrylate res-

ins, the allyl esters, acrylonitrile, certain butadiene copolymers, butadiene monoxide, and several halogenated monomers appear as well as many others. Most of this material was not included in the earlier edition.

There are, however, a number of important omissions such as the vast field of silicon resins, vinyl and methallyl ethers, and polyurethanes. These materials are all easily prepared. Directions for the preparation of Cerex are not yet available and polymers of ethylene and tetrafluoroethylene require special equipment for their preparation, but they are so important that they probably should be at least briefly mentioned in a book which attempts to cover the new developments.

The choice of material is excellent and there are few errors. On page 34, magnesium naphthenate is listed as a drier. Manganese naphthenate probably was the material the author intended to mention.

At the end of each experiment there is a list of questions. The reviewer believes it would be desirable to include a list of references which the student could consult when answering these questions. Examples would be the series of volumes edited by H. Mark which are very comprehensive and also Powers' "Synthetic Resins and Rubbers" (John Wiley & Sons), which, though a short book, contains most of the required information.

—*Homer vB. Joy, F.A.I.C.*

Chemical Corps Journal, Volume 1, Number 1, was issued in October 1946, as the official publication of the newly formed Chemical Warfare Association, Washington, D. C. It will be published quarterly.

Industrial Shows of the Americas, a new monthly magazine, is published by Scientific Service Unit, 403 Industries Building, New Orleans 13, Louisiana, and dedicated to the promotion of major industrial Exhibits. Its Volume 1, Number 1, dated October, 1946, features an article by Harold Black entitled "Meet the Optiant", intended to "assist exhibitors to portray graphically in terms understandable to the laymen certain rather complicated and abstract technical or scientific facts." The subscription is $2.00 per year.

The price of *An Outline of Organic Nitrogen Compounds* by Ed. F. Degering, F.A.I.C., and Collaborators is $7.50, instead of the pre-publication price listed in the September issue of THE CHEMIST. The book should be ordered from Fund 1709, Department of Chemistry, Purdue University, Lafayette, Indiana.

A complete file of THE CHEMIST, from its first printed issue in May 1928, is available. Please reply to Box B110, THE CHEMIST.

Instructor Wanted

Chemistry Instructor wanted. March or September 1947. Midwestern university. About 300 students in chemistry department. Miscellaneous duties but mostly lectures and laboratory supervision in physical and organic chemistry. State salary required. List training in mathematics and non-technical subjects. Correspondence confidential. Small photo returned, if postage included. Please reply to Box 113, THE CHEMIST.

A.I.C. Council Meetings

Meetings of the National Council of THE AMERICAN INSTITUTE OF CHEMISTS are held on the third Tuesday of each month, at six o'clock p.m. in The Chemists' Club, 52 East 41st Street, New York, N. Y. Dates for the current season are:

December 17, 1946
January 21, 1947
February 18, 1947
March 18, 1947
April 15, 1947
May (Annual Meeting)
June 17, 1947

Meeting Dates

NOV. 22nd — Washington Chapter, A.I.C., Speaker to be announced.

DEC. 4—Dinner Meeting, Niagara Chapter, A.I.C. Speaker, Dr. Foster D. Snell, president A.I.C., "Chemistry—a Profession."

DEC. 5th — Pennsylvania Chapter, A.I.C., Engineer's Club, 1317 Spruce St., Philadelphia. Dr. Lloyd Van Doren, secretary, The American Institute of Chemists, "Patents".

JAN. 22nd — Washington Chapter, A.I.C. Speaker to be announced.

FEB. 6th — Pennsylvania Chapter, A.I.C. Engineers' Club, 1317 Spruce St., Philadelphia. Speaker to be announced.

MAR. 6th — Pennsylvania Chapter, A.I.C., Engineers' Club, 1317 Spruce St., Philadelphia. Speaker to be anounced.

APR. 3rd — Pennsylvania Chapter, A.I.C., Engineers' Club, 1317 Spruce St., Philadelphia. Speaker to be announced.

New Directory Issued

The new directory of THE AMERICAN INSTITUTE OF CHEMISTS has just been issued. It contains names, addresses, and biographical briefs of members of the INSTITUTE up to September first.

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